ORDER NO. AD8806150C2

Service Manual

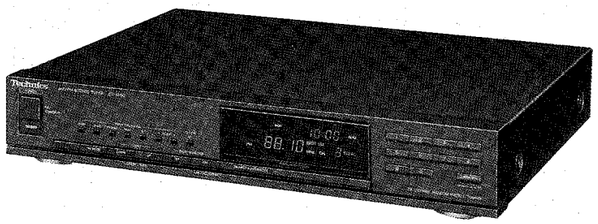
Tuner

QUARTZ Synthesizer
AM/FM Stereo Tuner

ST-X990

Color

(K).....Black Type



Area

Color	Area
(K)	(EG).....F.R.Germany.
(K)	(Ei) .....Italy.

SPECIFICATIONS

(DIN 45 500)

■ FM TUNER SECTION

Frequency range	87.50 ~ 108.00 MHz (50 kHz-steps)
Sensitivity	1.5 µV (IHF, usable)
S/N 30 dB	1.3 µV (75Ω)
S/N 26 dB	1.2 µV (75Ω)
S/N 20 dB	0.9 µV (75Ω)
IHF 46 dB stereo quieting sensitivity	28 µV / 75Ω
Total harmonic distortion	
MONO	0.15%
STEREO	0.3%
S/N	
MONO	70 dB (78 dB,IHF)
STEREO	65 dB (71 dB,IHF)
Frequency response	20 Hz ~ 15 kHz,(+0.5 dB ~ -2.0 dB)
Alternate channel selectivity	
±400 kHz	70 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	90 dB
IF rejection at 98 MHz	90 dB
Spurious response rejection at 98 MHz	90 dB
AM suppression	55 dB
Stereo separation	
1 kHz	40 dB
Carrier leak	
19 kHz	-70 dB (-80 dB,IHF)
38 kHz	-75 dB (-80 dB,IHF)
Channel balance (250 Hz ~ 6,300 Hz)	± 1.2 dB
Limiting point	1.0 µV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	
	522 kHz ~ 1611 kHz (9 kHz-steps)
	530 kHz ~ 1620 kHz (10 kHz-steps)
Sensitivity (S/N 20 dB)	20 µV,300 µV/m
Selectivity (± 9 kHz)	
(at 999 kHz)	55 dB
Image rejection	
(at 999 kHz)	40 dB
IF rejection	
(at 999 kHz)	60 dB

■ TIMER SECTION

Clock	Quarz-lock type 24-hour indication
Precision	Within 0 sec.~±10 sec. monthly(at 25 °C)
Functions	24-hour programmable weekly (1 time) once only (1 time) sleep (at 10~60 min)
Programmable content	Program source(FM,MW) Power ON/OFF timing Designation of preset station
Setting intervals	1 minute ~23 hours,59 minutes (at 1-min.intervals)
Priority order	sleep, once, weekly

■ GENERAL

Output voltage	0.5V (1.0V,IHF)
Power consumption	9W(clock 5W)
Power supply	AC 50 Hz/60 Hz,220V
Dimensions (W x H x D)	360 x 64.5 x 288 mm (14-3/16″x2-17/32″x11-11/32″)
Weight	2.1 kg (4.6 lb.)

Notes:
1.Specifications are subject to change without notice.
Weight and dimensions are approximate.
2.Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

ST-X990

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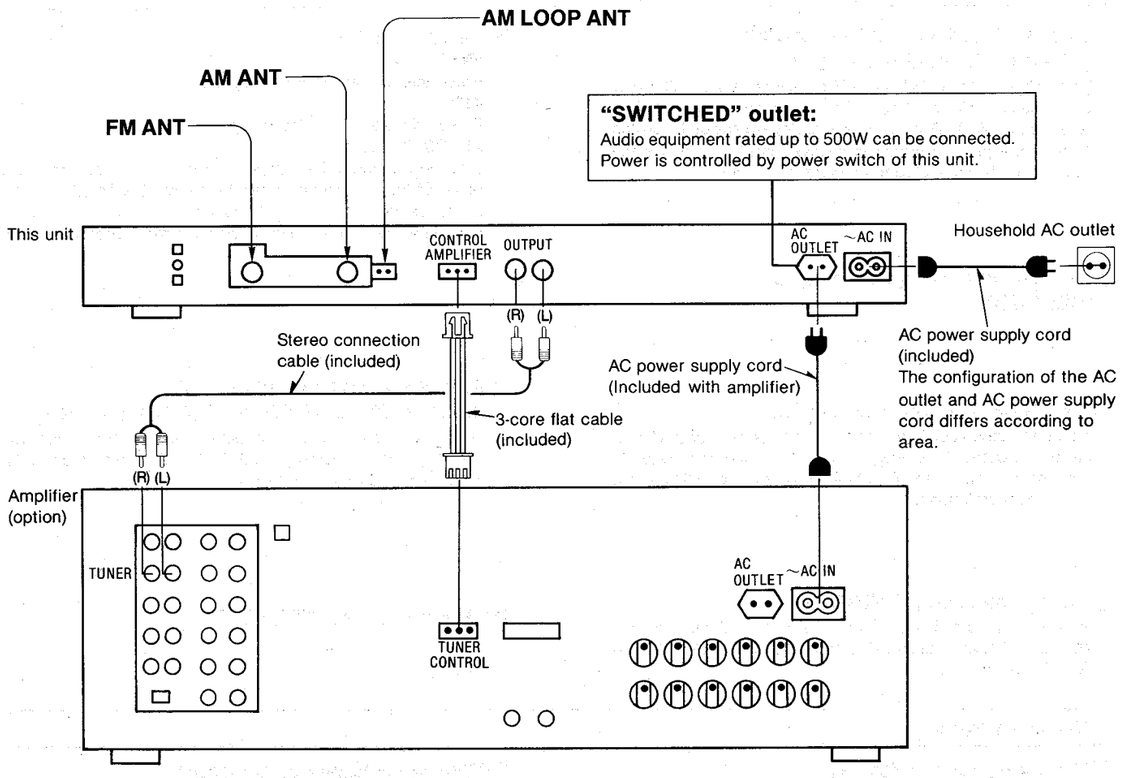
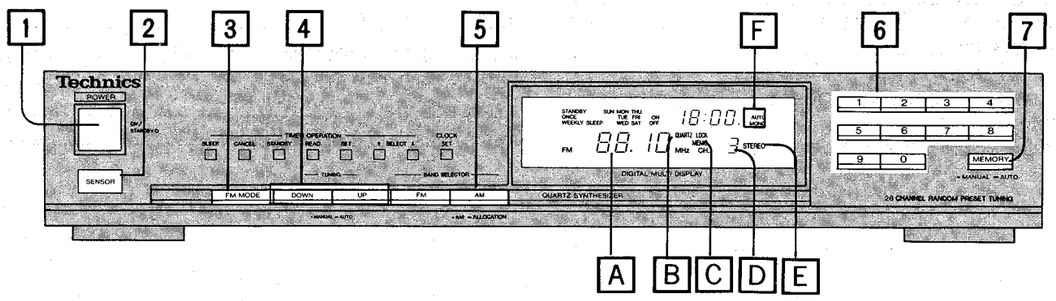
■ CONNECTIONS



■ LOCATION OF CONTROLS

The indication AM used here includes both MW and LW.

Tuner section



Control section

[1] Power "STANDBY ⏻/ON" switch (POWER "ON/STANDBY ⏻")

This switch switches ON and OFF the secondary circuit power only. The unit is in the "STANDBY" condition when this switch is set to the "STANDBY ⏻" position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

[2] Remote-control signal receptor (SENSOR)

[3] FM mode selector (FM MODE)

This unit automatically switches to the stereo mode when a stereo broadcast is received. Press this selector to listen in the monaural mode. The FM stereo indicator will not illuminate in the monaural mode.

[4] Tuning buttons (TUNING)

If the button is pressed momentarily and then released, the frequency will change at intervals of 0.05 MHz for FM and 9 kHz (or 10 kHz) for AM.

[5] Band selector

FM:
Press this button for FM reception.
AM:
Press this button for AM reception.
ALLOCATION:
If the AM button is kept depressed for about 3 seconds, the raster of the AM frequency will be set to 10 kHz. (Before the transmission it was set to 9 kHz.) To return to the previous frequency, keep this button depressed for 3 seconds again.

[6] Preset-tuning buttons (1 ~ 0) (28 CHANNEL RANDOM PRESET TUNING)

These buttons are used to preset FM and AM broadcast frequencies into the memory of this unit, and are also pressed to select the desired preset frequencies.

[7] Memory button (MEMORY)

Display section

[A] Digital frequency display

[B] Quartz-lock indicator (QUARTZ LOCK)

This indicator illuminates when tuned precisely to an FM or AM station.

[C] Memory indicator (MEMO)

[D] Channel display

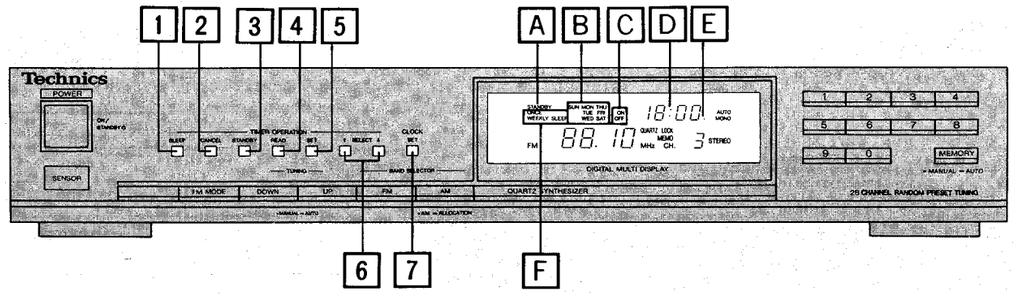
[E] FM stereo indicator (STEREO)

This indicator automatically illuminates when an FM stereo broadcast is being received.
Note:
It will not illuminate if the FM mode selector is set to the monaural mode.

[F] FM mode indicators

When FM broadcasts are being received, usually the "AUTO" indication is illuminated.
When the FM mode selector is used to select monaural reception, the word "MONO" illuminates.

Timer section



Control section

[1] Sleep timer set button (SLEEP)

This button can be used to set the time at which the power will be switched OFF.

[2] Timer-mode-cancel button (CANCEL)

This button can be used to erase the timer setting or to cancel a setting that is being made, if, for example, you decide to do something else.

[3] Timer-set temporary cancel button (STANDBY)

This button can be used to temporarily cancel the timer setting.

[4] Programming-check button (READ)

This button can be used to check the programmed setting.

[5] Program-set button (SET)

This button can be used, when making the timer setting, to select the type of timer operation, the day, the time, etc.

[6] Timer-mode/time-set buttons (SELECT)

These buttons can be used, when setting the present time, as well as for setting the day, time, etc. of the timer setting.

[7] Time-set button (CLOCK SET)

This button is used when setting the present time and when setting the day, time, etc.

Display section

[A] Timer standby indicator (STANDBY)

This indicator shows that the timer has been set to operate at the programmed time.

[B] Day indicator

This indicator shows the present day, and (if the timer has been set) the day it has been set for.

[C] Timer ON/OFF indicator (ON/OFF)

This indicator shows that the times for timer switch-ON and switch-OFF have been set.

[D] Time indicator

This indicator shows the present time, and (if the timer has been set) the time it has been set for.

[E] Colon indicator

This indicator shows, by flashing continuously, that the clock is operating.

[F] Timer-mode indicator (ONCE/WEEKLY/SLEEP)

This indicator shows the type of timer operation that has been selected.

ORDER NO. AD8806150C2-A

QUARTZ Synthesizer
AM/FM Stereo Tuner

DEUTSCH

Tuner

ST-X990

■ MESSUNGEN UND JUSTIERUNGEN

UKW JUSTIERUNGEN

Einstellungen der Bedienelemente und zu verwendende Geräte.

- UKW-Messender(UKW-MS)
- Stereo-Modulator
- Verzerrungs-Analystator
- Elektronische Gleichstrom-Voltmeter(EVM)
- Frequenzzähler
- Drosselspule(100µH)
- Widerstand(100kΩ)

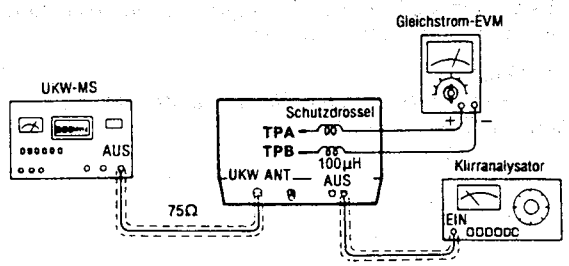
Anmerkung: Für Z202,Z251,L321 und L322 werden bereits justierte Ersatzteile geliefert. Die Kerne dieser Teile daher nicht drehen.

UKW-MONO-VERZERRUNGS-JUSTIERUNG

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Stellen Sie die Einheit auf **"FM(UKW)"** Betrieb.
3.Die Radiofrequenzanzeige und den Messender auf **100.10MHz** einstellen.
4.Den Kern von **T201** so justieren, daß die im Signalzustand gemessene Spannung **0mV (0±20mV)** im 300mV-Bereich beträgt.
5.**T202** so justieren, daß der Verzerrungsfaktor des linken Kanals minimal wird.
6.Schritte 4 und 5 einige Male wiederholen.
7.Versichern Sie sich, daß die Verzerrungsfaktoren von Kanal L und Kanal R annähernd gleich sind und auf ein Minimum gehalten sind.

Anmerkung:
Für die Justierung ist ein Schraubendreher aus Kunststoff zu verwenden.

ZUSTAND DES UKW-MESSENDERS
Modulation 100%
Modulationsfrequenz 1kHz
Ausgangspegel 66dB



TPA = TP201 , TPB = TP202

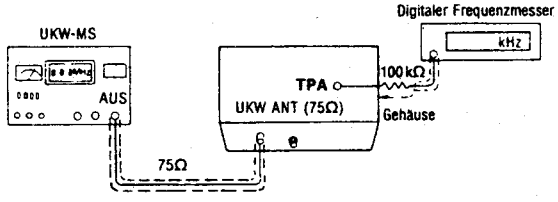
MPX-SGO-JUSTIERUNG

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Den UKW-Bertriebsart-Wahlshalter in die **"on/auto"** Position stellen.
3.Radio und Meßsender auf **100.10MHz** einstellen.
4.**VR301** auf **19kHz ± 30Hz** auf der Frequenzzähleranzeige justieren.

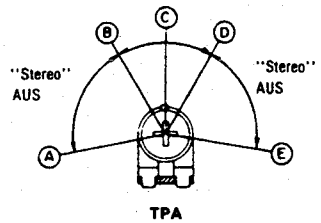
● VERWENDUNG EINES ALTERNATIVSYSTEMS

1.Stereosignal vom Meßsender eingeben oder eine Stereo-Sendung empfangen.
2.**VR301** justieren, bis die Stereo-Anzeige aufleuchtet. Den Arm von **VR301** mit Lack sichern, wie in der Abbildung gezeigt.

ZUSTAND DES UKW-MESSENDERS
Modulation 100%
Modulationsfrequenz 0kHz
Ausgangspegel,.....66dB



TPA = TP301



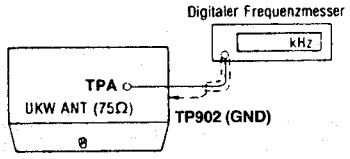
TPA

Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... "Stereo" AUS Stellung
Ⓑ−Ⓓ..... "Stereo" EIN Stellung (Anzeigebeleuchtung)
Ⓒ..... Einstellpunkt des pilotschaltkreis'

TPA = VR301

ELNSTELLUNG DER PHASENSPERRUNG EINES SCHLEIFENVERSCHIUSSES

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Den UKW-Bertriebsart-Wahlshalter in die **"AM"** Position stellen.
3.Drucken Sie den Prüfpunktnopf.
4.Stellen Sie den Radiofrequenzbildschirm auf **"1629kHz"**.
5.**CT901** auf **524.288kHz± 10Hz** auf der Frequenzzähleranzeige justieren.



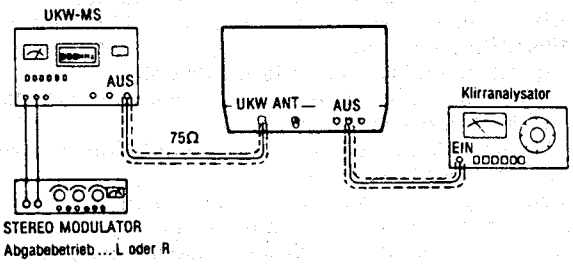
TPA = TP901

UKW STEREO KLIRRFAKTOR-JUSTIERUNG

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Stellen Sie die Einheit auf **"FM(UKW)"** Betrieb.
3.Die Radiofrequenzanzeige und den Messender auf **100.10MHz** einstellen.
4.**T1** so justieren, daß der Verzerrungsfaktor des linken Kanals minimal wird.
5.überprüfen, daß die Verzerrungsfaktoren des linken und rechten Kanals fast gleich sind.

Anmerkung:
Für die Justierung ist ein Schraubendreher aus Kunststoff zu verwenden.

ZUSTAND DES UKW-MESSENDERS
Modulation .....”L”order ”R” Betriebsart 90%,Pilotssignal 10%
Modulationsfrequenz .....1kHz(Pilot 19kHz)
Ausgangspegel 66dB



Printed in Japan
F880602097 TW

●REMOTE CONTROL TRANSMITTER (EUR64754)

For detailed information concerning operation steps, etc., please refer to the appropriate page for each unit and the respective operation instructions. For this system, you can listen to the tapes or compact discs, etc. by operating the remote-control transmitter without pressing the amplifier's input selector.

Note: The control panel of the remote-control transmitter may be covered by a clear plastic protective sheet. This sheet may be removed if desired.

Before beginning

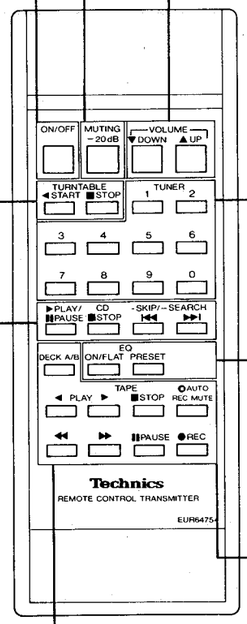
"ON"
(The frequency will be displayed on the digital frequency display.)

Note that there is no need to press this button if the tuner's power is ON. (If it is pressed, the tuner will be switched to standby mode.)

While listening to music

Press this button to temporarily reduce the volume level. The volume level is attenuated by 20 dB. (approx. 1/10) Press once again to return to the previous volume level.

Adjust the volume level.



Listening to phono discs

◄START — Press to start the play.

TURNTABLE ■STOP — Press to stop the play.

Listening to compact discs

►PLAY/ ❚❚PAUSE — Press to start the play.

►PLAY/ ❚❚PAUSE — Press to temporarily stop the play. Press once again to resume the play.

CD ■STOP — Press to stop the play.

To search for a certain track (skip play)

-SKIP/-SEARCH ⏮ — Press momentarily to search for the track now playing. Repeat this step the necessary number of times to search for a previous track.

-SKIP/-SEARCH ⏭ — Press momentarily to search for the next track.

To search for a desired position (search play)

-SKIP/-SEARCH ⏮ — To move backward quickly on the disc, press and hold, and then release at the desired position.

-SKIP/-SEARCH ⏭ — To move forward quickly on the disc, press and hold, and then release at the desired position.

Listening to radio broadcasts

1 – 0 — Press to listen to the desired preset "channel".

To listen to sound corrected by an euqalizer

ON/FLAT — Press to switch the equalizer correction ON. Press once again to switch it OFF.

PRESET — Press to retrive the memorized curve. (For Technics graphic equalizer with the preset memory function only.)

Listening to tapes

1 DECK A/B — Press to select the deck ("DECK A" or "DECK B") operated.

2 ◄PLAY ►PLAY — ►:For foward side ◄:For reverse side
Press to select the tape side for playing back. (Playback will start.)

TAPE ■STOP — Press to stop the playback.

◄◄ ►► — Press to advance or rewind the tape.
Press to select the desired tune in the play mode
(For Technics tape deck with the "music select" functions only.)

❚❚PAUSE — Press to temporarily stop playback. Press the playback button to resume the play.

Recording

Note: For Technics tape decks (RS-X950, RS-X980, etc.), "DECK B" has no record capability.

1 DECK A/B — Press to select the deck ("DECK A" or "DECK B") operated

2 ●REC — Press.
(Recording stand-by mode)

3 Begin the sound source.

4 ◄PLAY ►PLAY
Press to select the tape side for recording. (Recording will begin.)

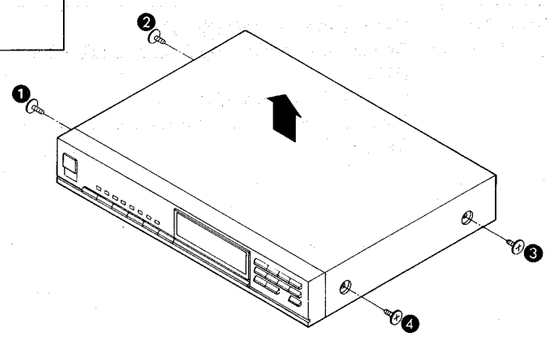
TAPE ■STOP — Press to stop the recording.

❚❚PAUSE — Press to temporarily stop recording. To begin recording once again, press the playback button.

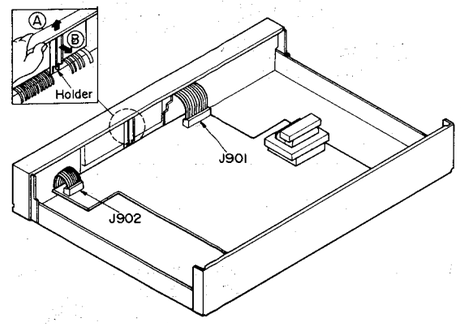
AUTO REC MUTE — Press to make an un recorded space
(After 4 seconds, the tape deck will automatically change to the recording stand-by mode.)
To start the recording again, press the playback button .

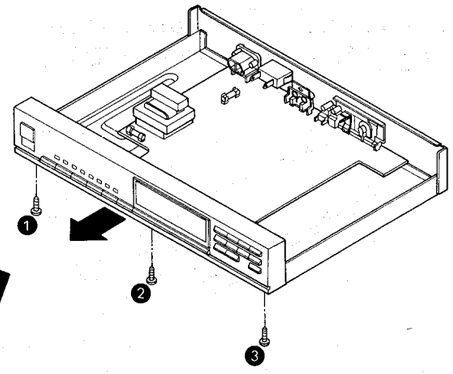
■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the cabinet
Procedure 1	●Remove the 4 screws (❶~❹).



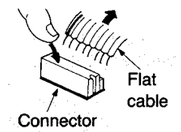
Ref. No. 2	How to remove the front panel
Procedure 1→2	1. Remove the flat cable (J901, J902). 2. Push the front panel in the direction of the arrow Ⓐ and remove the holder in the direction of the arrow Ⓑ. 3. Remove the 3 secrews (❶~❸). 4. Remove the front panel in the direction of the arrow.



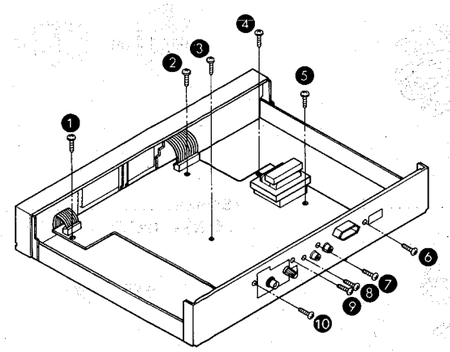


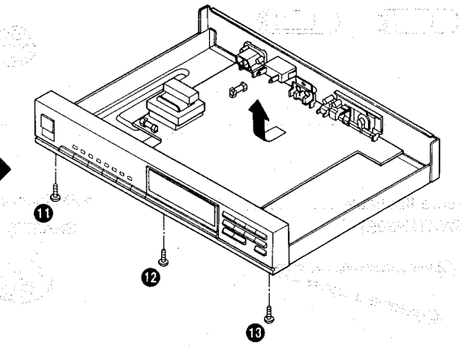
How to remove the flat cable

Pull out the flat cable while pressing the connector

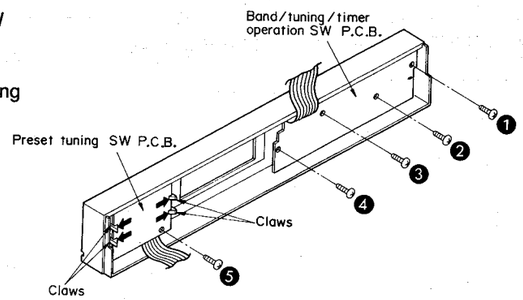


Ref. No. 3	How to remove the main P.C.B.
Procedure 1→3	1. Remove the 10 screws (❶~❿). 2. Remove the 3 screws (⓫~⓭). 3. Slightly pull the front panel toward you and remove the main P.C.B.

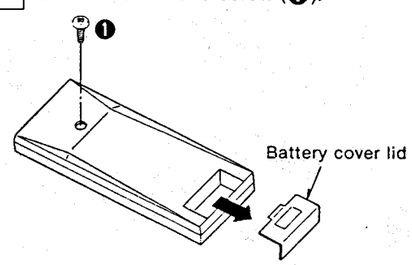


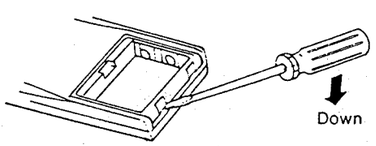


Ref. No. 4	How to remove the preset tuning SW P.C.B. and band/tuning/timer operation SW P.C.B.
Procedure 1→2→4	1. Remove the 4 screws (❶~❹). 2. Remove the band/tuning/timer operation SW P.C.B. 3. Remove the 1 screw (❺). 4. Push the 4 claws and remove the preset tuning SW P.C.B.

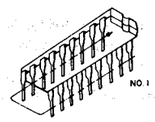


Ref. No. 5	How to remove the remote control
Procedure 5	1. Remove the battery cover lid. 2. Remove the one screw (❶). 3. Insert a screwdriver blade between the upper and lower covers inside the battery compartment and then slowly loosen the bottom cover.



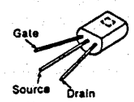


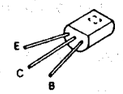
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



SVIUPC 1161C3	16 Pin
LM7001	16 Pin
AN7273B	18 Pin

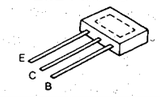
2SK544F-AC

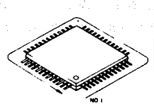




2SC3940A-Q
2SC2787L
2SC2786M
2SC1675L
2SC1685RST

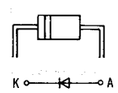
2SC2603EFG
2SC1740SQ
2SA933SQR
2SD1450RS



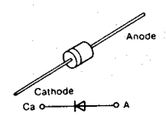


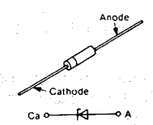
UPD7519HG600	64 pin

1SR35200



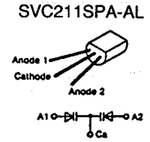
MA165, MA162A
MA700A





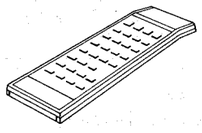
MA4051M,
MA4062M,
MA4150M
MA4330L
MA4043M
MA4100M

SVC211SPA-AL

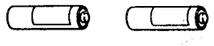


■ ACCESSORIES

- Remote-control transmitter (EUR64754) 1

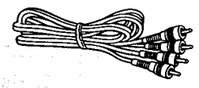


- Batteries 2 (UM-4NE)

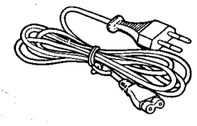


- 3-core flat cable 1 (SWKTX930E)

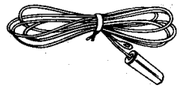
- Stereo connection cable 1 (SJPK2203-1)



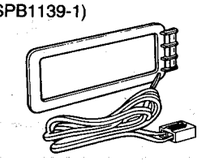
- AC power supply cord 1 (SFDAC05E03)



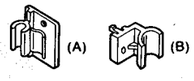
- FM indoor antenna 1 (SSA270)



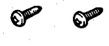
- AM loop antenna 1 (SPB1139-1)



- AM antenna holders 2 (SMA231M) (SMA233-1M)

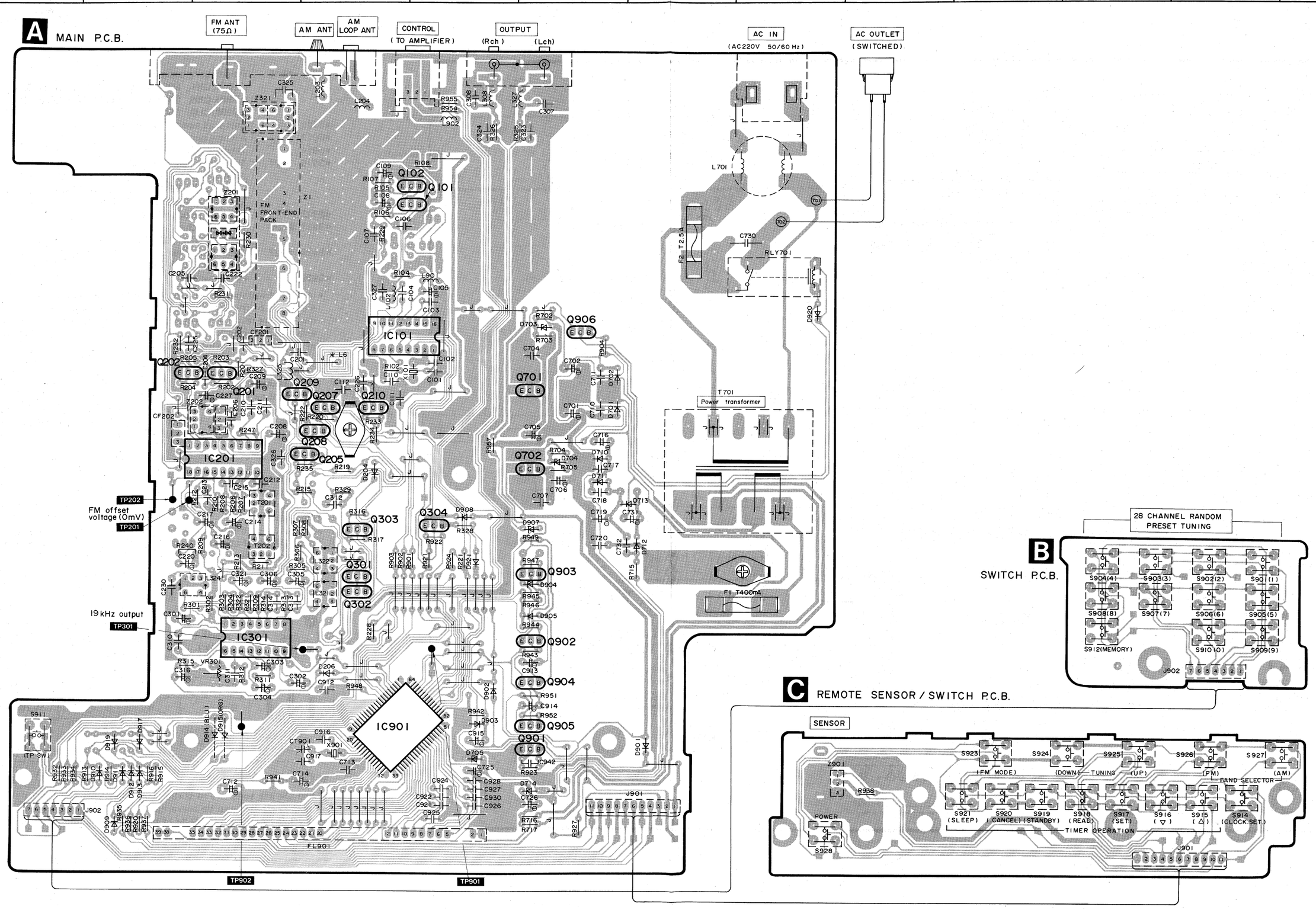


- Screws ..... 2 (XTN3+10AFZ)



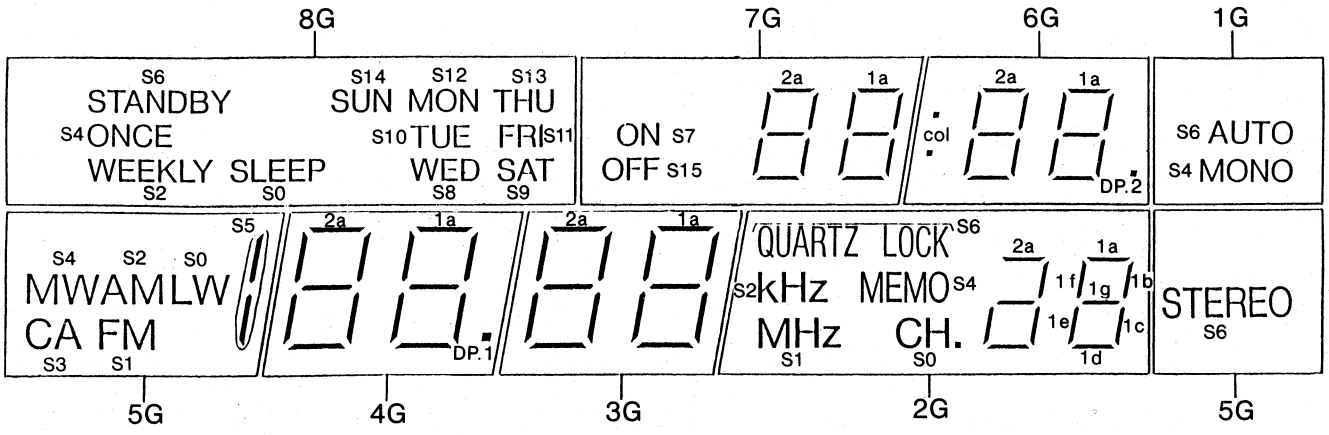
Note: Configuration of AC power supply cord and FM indoor antenna differs according to area.

■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



■ DESCRIPTION OF FL PANEL

•GRID ASSIGNMENT



•PIN CONNECTION

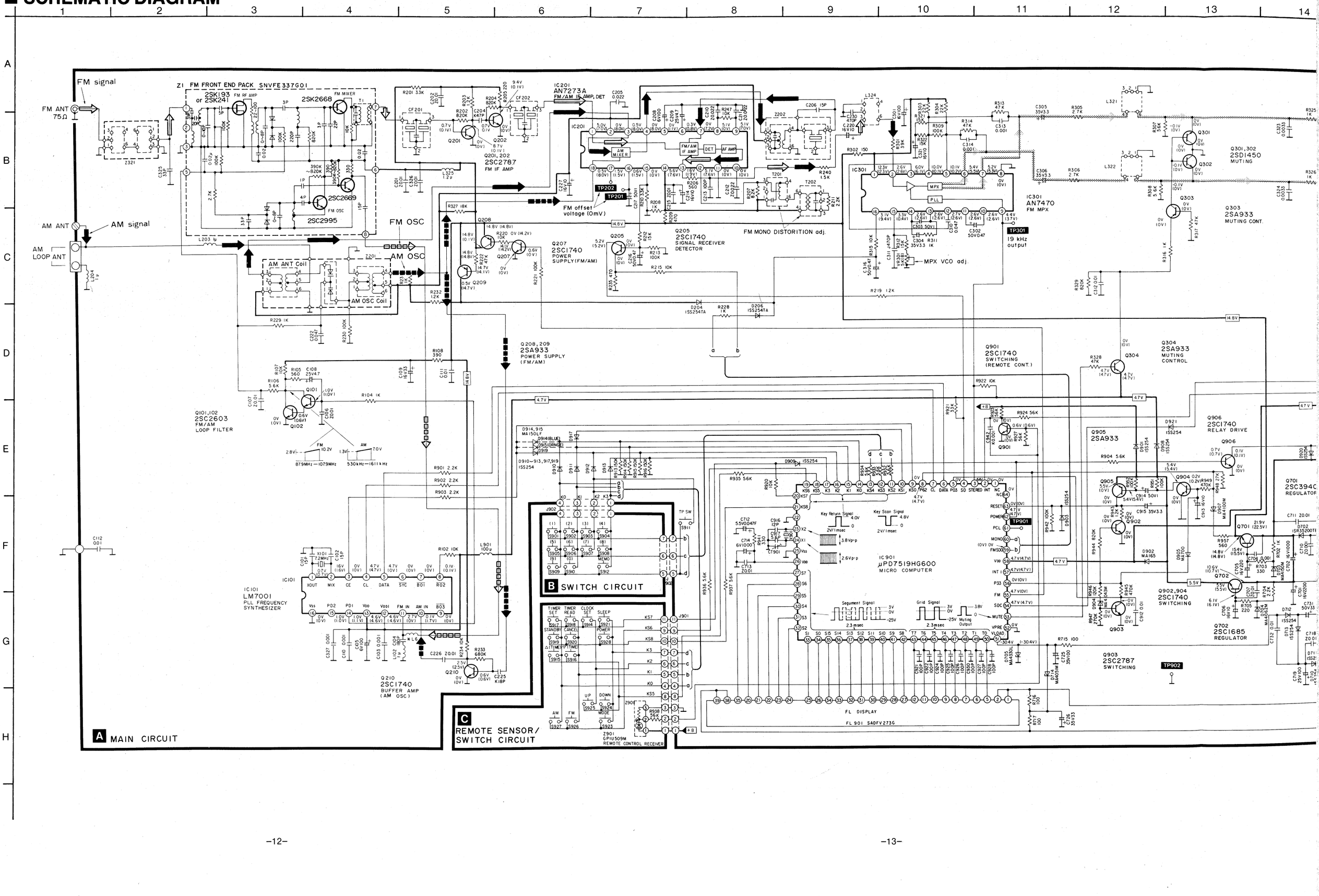
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
CONNECTION	F 1	F 1	N P	N P	8 G	7 G	6 G	5 G	4 G	3 G	2 G	1 G	N P	N P	N P	N P	N P	N P	N P	S 6	S 5	S 4	S 3	S 2	S 1	S 0	S 8	S 9	S 10	S 11	S 12	S 13	S 14	S 15	S 7	N P	N P	F 2	F 2

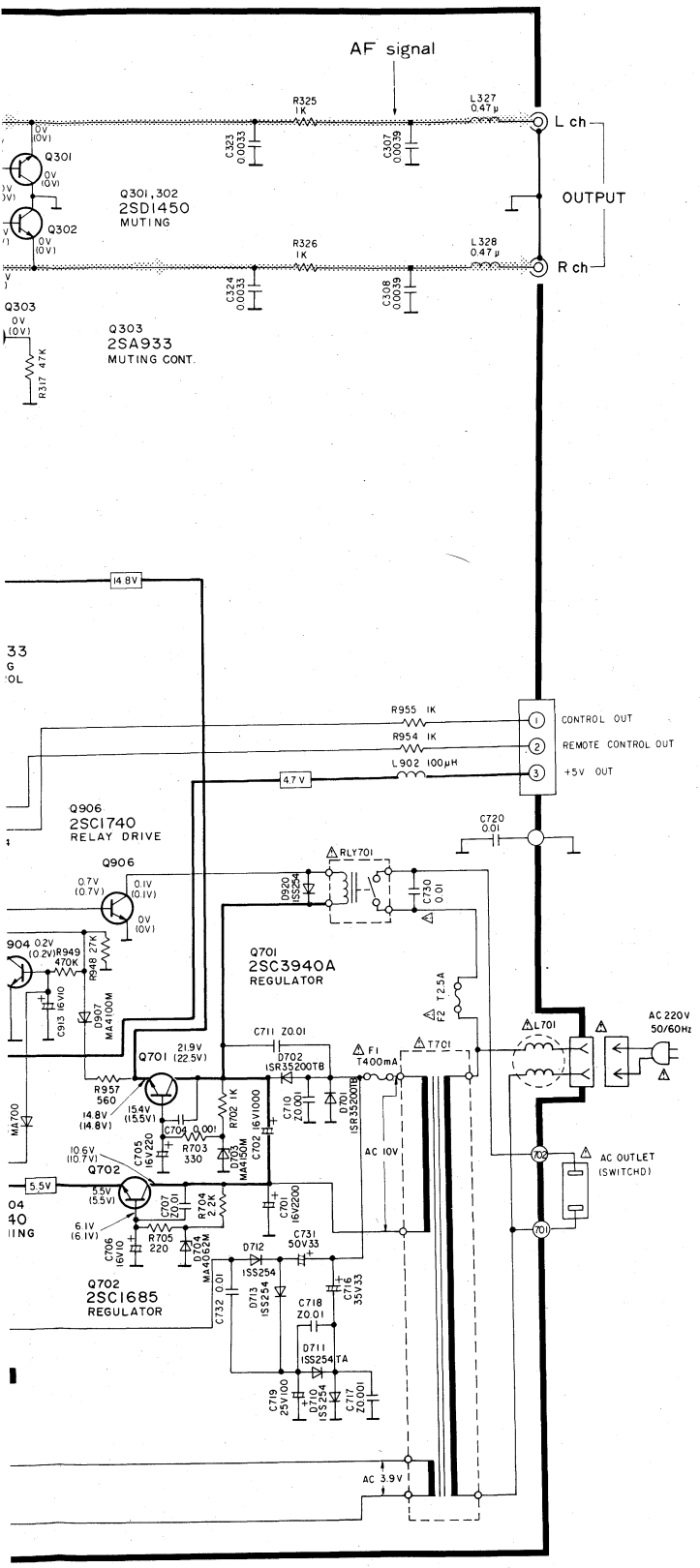
•ANODE CONNECTION

	8G	7G	6G	5G	4G	3G	2G	1G
S0	SLEEP	2d	2d	LW	2d	2d	CH.	-
S1	-	2e	2e	FM	2e	2e	MHz	-
S2	WEEKLY	2c	2c	AM	2c	2c	kHz	-
S3	-	2g	2g	CA	2g	2g	2c	-
S4	ONCE	2f	2f	MW	2f	2f	MEMO	MONO
S5	-	2b	2b		2b	2b	2b	-
S6	STANDBY	2a	2a	STEREO	2a	2a	QUARTZ LOCK	AUTO
S7	-	O N	col	-	-	-	-	-
S8	WED	1d	1d	-	1d	1d	1d	-
S9	SAT	1e	1e	-	1e	1e	1e	-
S10	TUE	1c	1c	-	1c	1c	1c	-
S11	FRI	1g	1g	-	1g	1g	1g	-
S12	MON	1f	1f	-	1f	1f	1f	-
S13	THU	1b	1b	-	1b	1b	1b	-
S14	SUN	1a	1a	-	1a	1a	1a	-
S15	-	OFF	DP,2	-	DP,1	-	2a,d,e,g	-

ST-X990 ST-X990

■ SCHEMATIC DIAGRAM





(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

- **S901~S910** : Preset tuning switches.
  S901: CH1, S902: CH2, S903: CH3, S904: CH4, S905: CH5, S906: CH6, S907: CH7, S908: CH8, S909: CH9, S910: CH0
- **S911** : Test point switch. **(PLL clock)**
- **S912** : Memory switch.
- **S914** : Time-set switch.
- **S915~S921** : Timer operation switches.
  S915: SELECT(▲), S916: SELECT(▼) S917: SET, S918: READ, S919: STANDBY S920: CANCEL, S921: SLEEP
- **S922** : FM mode selector switch.
- **S923, S924** : Tuning switches.
  S923: DOWN, S924: UP
- **S925~S927** : Band selector switches.
  S925: FM, S926: AM
- **S928** : Power switch.

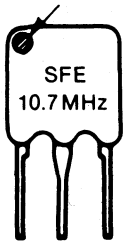
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester. ( ): AM voltage
- Positive voltage lines — AF signal lines
  FM OSC — FM signal
  AM OSC — AM signal
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Note 2:

• Use of ceramic filters in pairs

The ceramic filters (CF201, CF202) for FM-IF circuit are available in three ranks. For this circuit, be sure to use the ceramics of the same rank in a pair.
At repairing and replacement, pay close attention to the diodes (D906, D907) for use as different diodes must be used depending on each rank of the ceramic filters.

Color marking
(Red, Black or White)



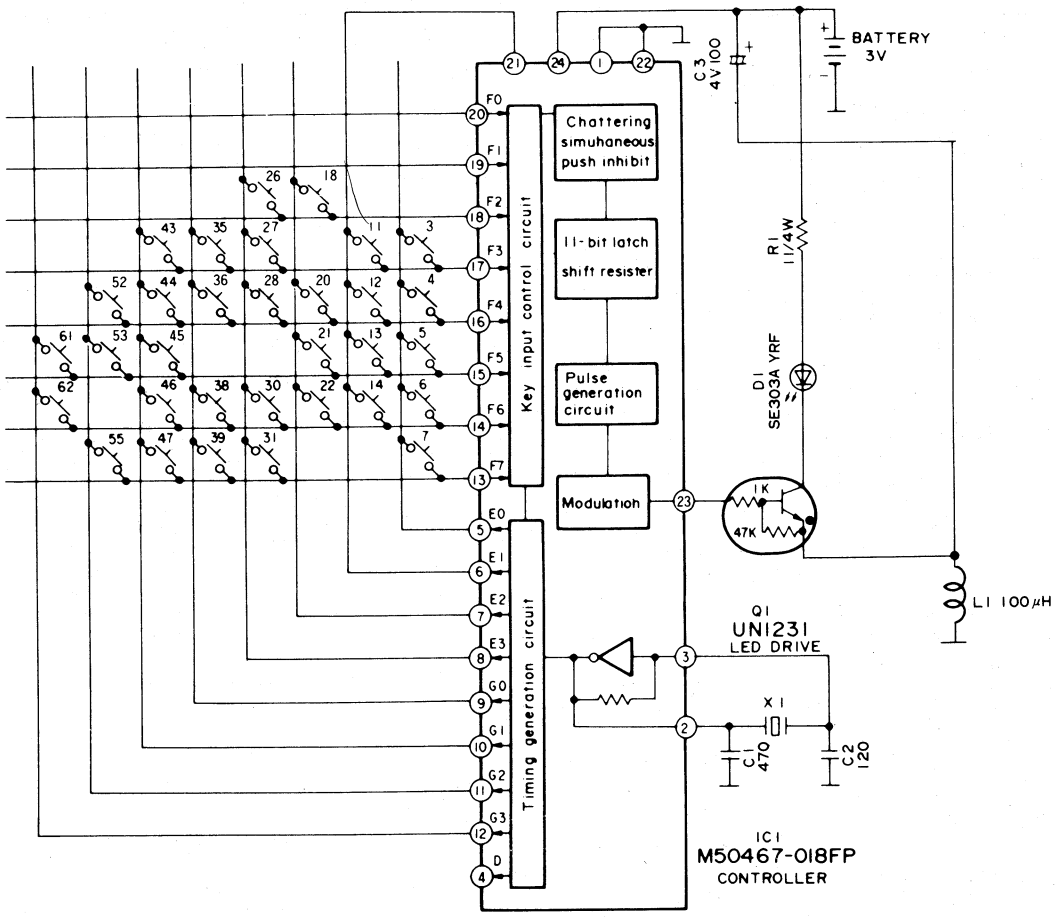
RANK (Color)	D906	D907	CENTER FREQUENCY
White	○	×	10.65MHz
Red	×	×	10.70MHz
Black	×	○	10.76MHz

Note: ○ mark: Diode is used.
× mark: Diode is not used.

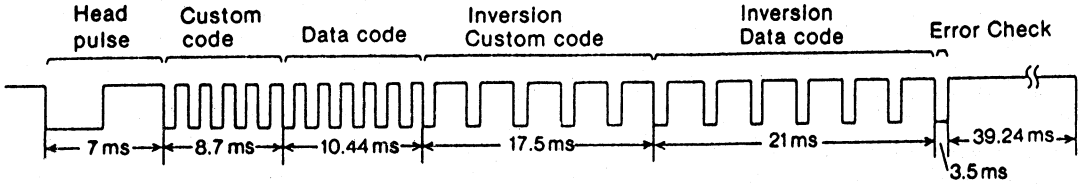
✱ Caution!

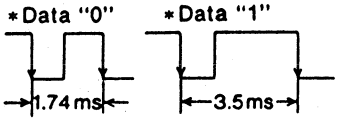
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
✱ Cover the parts boxes made of plastics with aluminum coil.
✱ Ground the soldering iron.
✱ Put a conductive mat on the work table.
✱ Do not touch the legs of IC or LSI with the fingers directly.

• Remote control unit



• Remote control data code





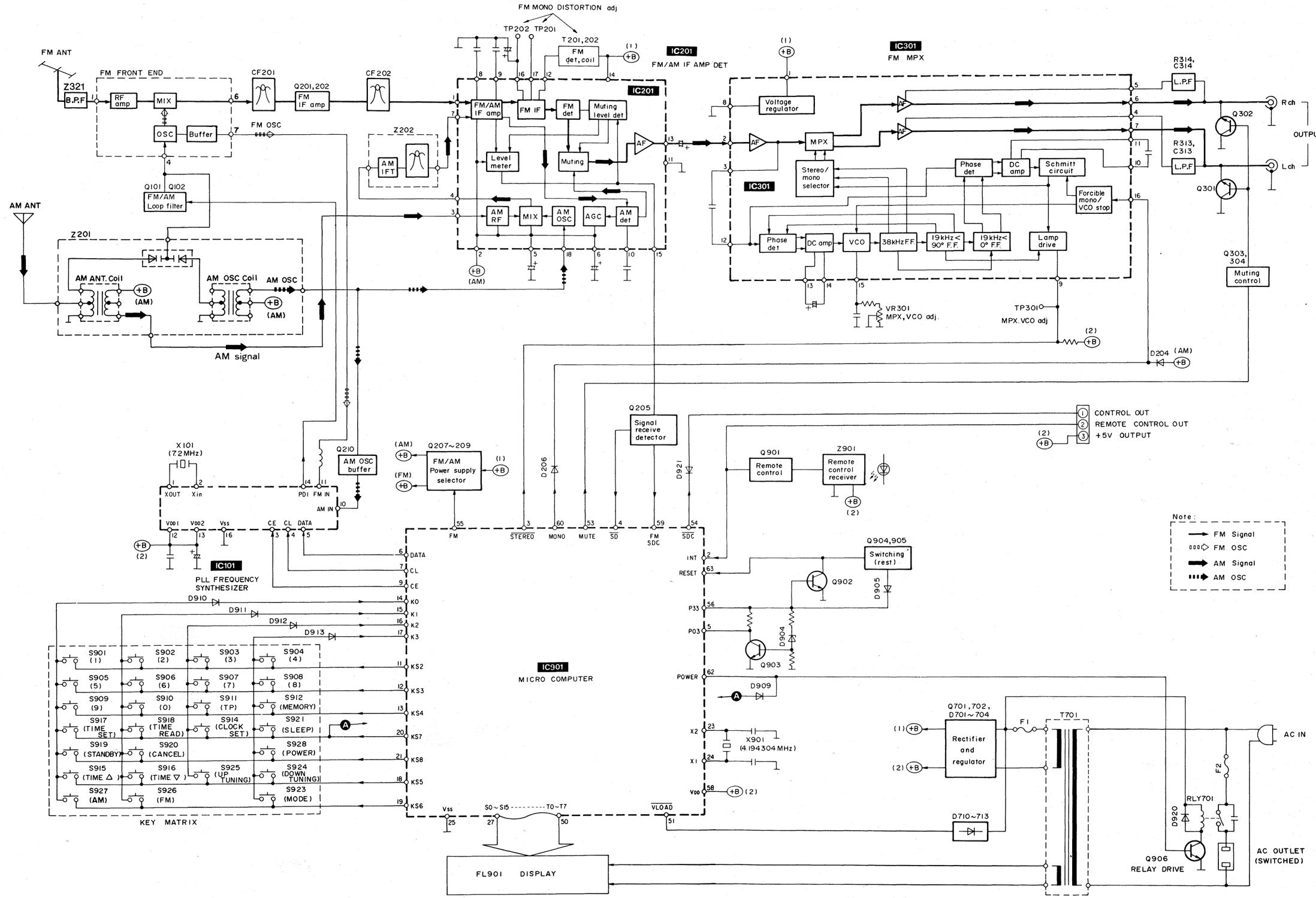
Key No.	Function	Custom code	Data code	Key No.	Function	Custom code	Data code
3	Auto rec mute	01001	000111	30	Tuner 8	01001	010111
4	Deck play ◀	01001	001001	31	Tuner 1	01001	010000
5	Vol. up	01001	100100	35	CD • skip/search	01100	000010
6	Tuner 5	01001	010100	36	Pause	01001	000110
7	Power ON/OFF	01001	100000	38	Tuner 9	01001	011000
11	CD play/pause	01100	001010	39	Tuner 2	01001	010001
12	Deck play ▶	01001	001010	43	CD • skip/search	01100	000011
13	Vol. Down	01001	100101	44	Deck stop	01001	000000
14	Tuner 6	01001	010101	45	※1	01001	110011
18	Turntable start	01001	001100	46	Tuner 0	01001	011001
20	Deck ◀◀	01001	000010	47	Tuner 3	01001	010010
21	Muting	01001	100111	52	Rec Pause	01001	001000
22	Tuner 7	01001	010110	53	Deck A/B	01001	000100
26	Turntable stop	01001	001101	55	Tuner 4	01001	010011
27	CD stop	01100	000000	61	EQ • OF/FLAT	01001	110000
28	Deck ▶▶	01001	000011	62	EQ Preset	01001	110010

■ FUNCTIONS OF IC TERMINALS (IC901: UPD7519HG600)

Pin No.	Terminal Name	Symbol	Function
1	NC	———	———
2	INT0	INT	Remote-control input Leading edge
3	P01	STEREO	Stereo input Active Low
4	P02	SD	Station detector input Active Low
5	P03		Voltage detector input Active High
6	P60	SO	Serial data output
7	P61	SCK	Serial clock output
8	P62		Power failure detection Active Low
9	P63	KS0, CE	Key source output and CE for serial transfer
10 ~ 13	P50 ~ P53	KS1 ~ KS4	Key source output Active High
14 ~ 17	P10 ~ P13	K0 ~ K3	Key return signal input Active High
18 ~ 21	P40 ~ P43	KS5 ~ KS8	Key source output Active High
22	EVENT	NC	Non-Connection Connected to non-connection Vss
23 24	X2 X1	X2 X1	Crystal oscillator 4.19 MHz
25	Vss	GND	GND terminal
26	VDD	VDD	Power terminal 5 V±10%
27 ~ 34	S7 ~ S0	S7 ~ S0	Segment output for FIP High withstand voltage output terminal
35 ~ 42	S15 ~ S8	S15 ~ S8	Segment output for FIP High withstand voltage output terminal
43 ~ 50	T7 ~ T0	T7 ~ T0	Digit output for FIP High withstand voltage output terminal
51	VLOAD	VLOAD	Pull-down resistance common terminal for FIP −30 V
52	VPRE	VPRE	Power aupply for pre-driver

Pin No.	Terminal Name	Symbol	Function
53	P30	MUTE	Muting output Active Low
54	P31	SDC	DTS selective output Active Low
55	P32	FM	FM selective output High...FM Low...AM
56	P33		HALT mode output Active High
57	INT1	INT1	HALT mode (backup) reset Connected in parallel to P62 power failure detector terminal
58	VDD	VDD	Power terminal (same as pin ㉖)
59	P20	FMSDC	FM simultaneous SD circuit control output (only auto tuning and auto scan memory) Active High
60	P21	MONO	FM forced monaural output High...Forced MONO Low...AUTO
61	P22	PCL	Measuring terminal for internal system clock to count $\frac{f_x}{16}=f_0$
62	P23	POWER	Power output High...ON Low...OFF
63	RESET	RESET	Reset terminal
64	PPO	TIMER POWER	High with timer power ON→HIGH Low with timer power OFF→LOW Active High

■ BLOCK DIAGRAM



■ MEASUREMENTS AND ADJUSTMENTS

FM ADJUSTMENT

Control positions and equipment used

- FM signal generator(FM-SG)
- Stereo modulator
- Distortion analyser
- DC electronic voltmeter(EVM)
- Frequency counter
- Choke coil(100μH)
- Resistor(100kΩ)

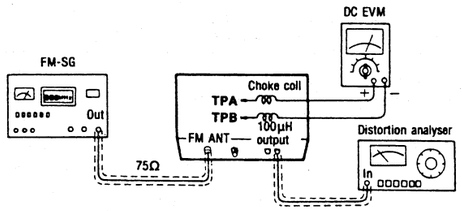
Note: For Z202(AM-IFT), Z251(AM ANT and OSC coil), L321 (L.P.F) and L 322(L.P.F), they are supplied as adjusted parts. So, do not turn the cores of the parts.

FM MONO DISTORTION ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"FM"** mode.
3.Set the radio frequency display and signal generator to **100.10MHz**.
4.Adjust the core of **T201** so that the voltage measured in signal mode is **0mV(0±20mV)** in 300mV range.
5.Adjust **T202** so that the distortion factor of L-CH is minimized.
6.Repeat steps 4 and 5.
7.Make sure that the distortion factors of L-CH and R-CH are nearly the same and minimum.

Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency 1kHz
Output level.....66dB



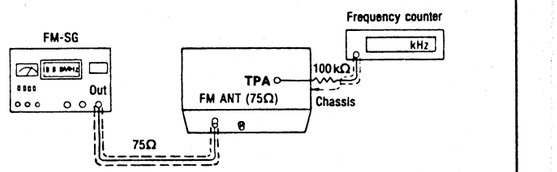
TPA = TP201 , TPB = TP202

MPX VCO ADJUSTMENT

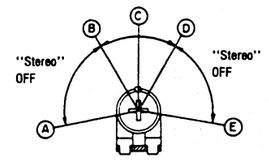
1.Test equipment connection is shown in figure.
2.Set the unit to **"on/auto"** position.
3.Set the radio frequency display and signal genarator to **100.10MHz**.
4.Adjust **VR301** for **19kHz±30Hz** on frequency counter reading.

USING ALTERNATE SYSTEM
1.Receive the stereo broadcast.
2.Adjust **VR301** until stereo indicator lights up. Fix the arm of **VR301** as shown in figure.

FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency 0kHz
Output level.....66dB



TPA = TP301



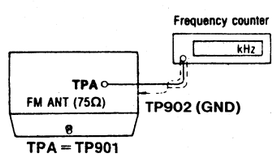
TPA

Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... "Stereo" OFF position
Ⓑ−Ⓓ..... "Stereo" ON position (Indicator lighting)
Ⓒ..... Adjust point of pilot circuit

TPA = VR301

PLL CLOCK FREQUENCY ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"AM"** position.
3.Push the Test point switch **(S911).**
4.Set the radio frequency display **1629 kHz**.
5.Adjust **CT901** for **524.288kHz±10Hz** on frequency counter reading.



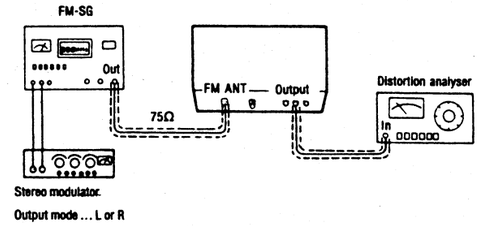
TPA = TP901

FM STEREO DISTORTION ADJUSTMENT

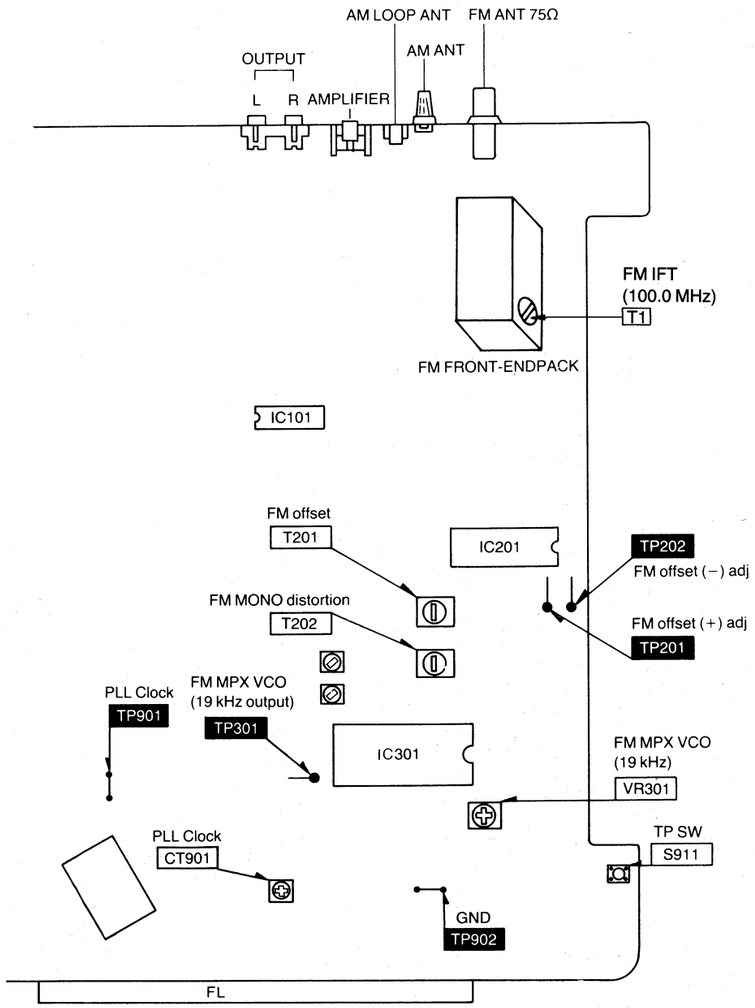
1.Test equipment connection is shown in figure.
2.Set the unit to **"FM"** mode.
3.Set the radio frequency display and signal generator to **100.10MHz**.
4.Adjust **T1** so that the distortion factor of L-CH is minimized.
5.Make sure that the distortion factors of L-CH and R-CH are nearly the same and minimum.

Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation .....”L”mode or ”R”mode 90%, Pilot 10%
Modulation frequency .....1kHz(Pilot 19kHz)
Output level.....66dB



●ADJUSTMENT POINTS



■ REPLACEMENT PARTS LIST

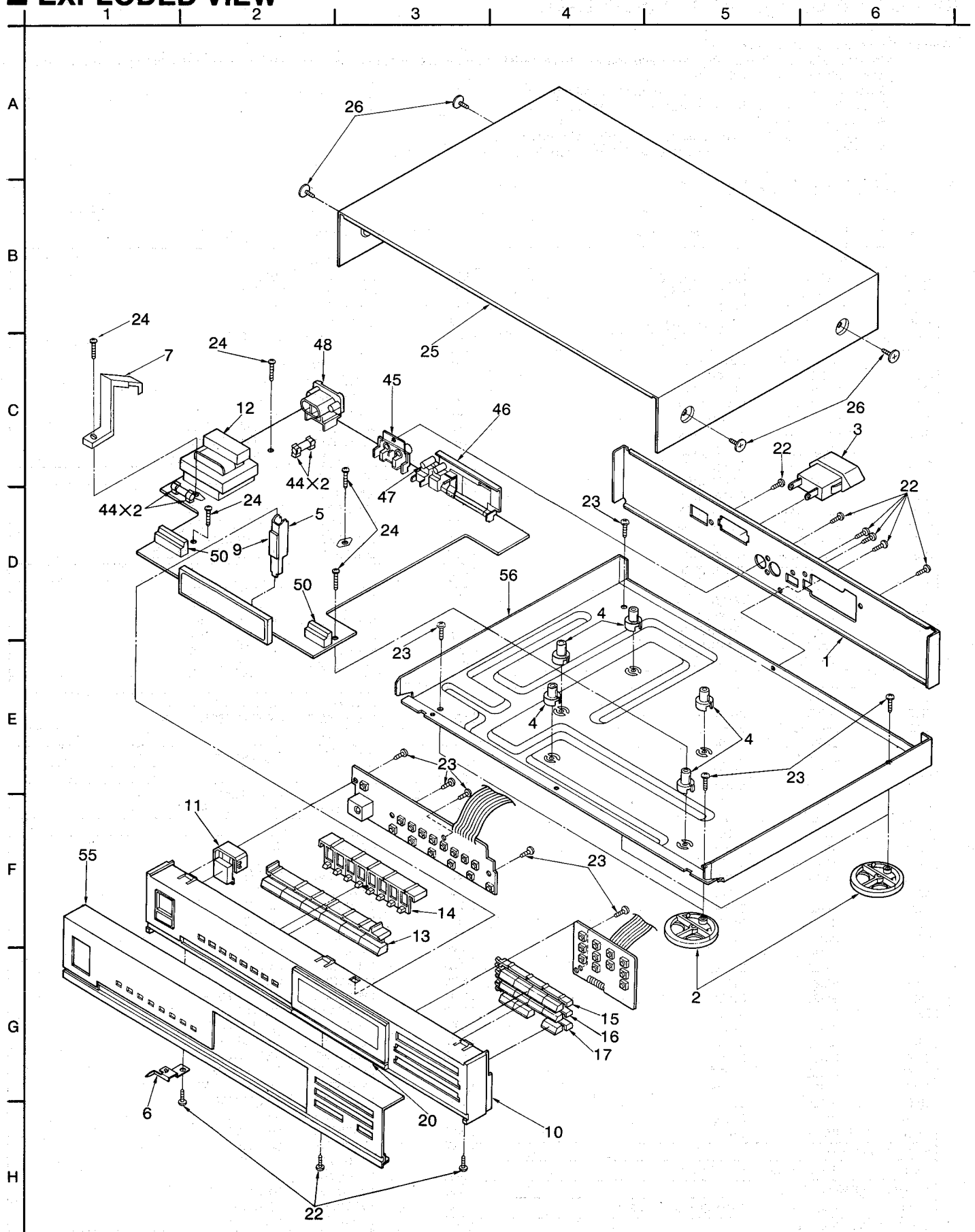
Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.
* Remote Control Ass'y:
Supply period for three years from termination of production.
* Ⓕ : Indicates parts that are suppled by PFS.(Panasonic France S.A.Longwy division)

•ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	LM7001	I.C. PLL SYNTHE
IC201	AN7273B	I.C. IF AMP/DET
IC301	SVIUPC1161C3	I.C. FM MPX
IC901	UPD7519HG600	I.C. MICRO COMPUTER
TRANSISTORS		
Q101	2SC2603EFG	TRANSISTOR
Q102	2SC2603EFG	TRANSISTOR
Q201	2SC2787L	TRANSISTOR
Q202	2SC2787L	TRANSISTOR
Q205	2SC1740SQ	TRANSISTOR
Q207	2SC1740SQ	TRANSISTOR
Q208	2SA933SQR	TRANSISTOR
Q209	2SA933SQR	TRANSISTOR
Q210	2SC1740SQ	TRANSISTOR
Q301	2SD1450RS	TRANSISTOR
Q302	2SD1450RS	TRANSISTOR
Q303	2SA933SQR	TRANSISTOR
Q304	2SA933SQR	TRANSISTOR
Q701	2SC3940AQSTA	TRANSISTOR
Q702	2SC1685RST	TRANSISTOR
Q901	2SC1740SQ	TRANSISTOR
Q902	2SC1740SQ	TRANSISTOR
Q903	2SC2787L	TRANSISTOR
Q904	2SC1740SQ	TRANSISTOR
Q905	2SA933SQR	TRANSISTOR
Q906	2SC1740SQ	TRANSISTOR
DIODES		
D204	MA165	DIODE
D206	MA165	DIODE
D701	SVD1SR35200A	DIODE
D702	SVD1SR35200A	DIODE
D703	MA4150M	DIODE
D704	MA4062-M	DIODE
D705	MA4330L	DIODE
D710	MA165	DIODE
D711	MA165	DIODE
D712	MA165	DIODE
D713	MA165	DIODE
D714	MA4051-M	DIODE
D901	MA165	DIODE
D902	MA165	DIODE
D903	MA165	DIODE
D904	MA4043M	DIODE
D905	MA700A	DIODE
D907	MA4100M	DIODE
D908	MA165	DIODE
D909	MA165	DIODE
D910	MA165	DIODE
D911	MA165	DIODE
D912	MA165	DIODE
D913	MA165	DIODE
D914	MA162A	DIODE
D915	MA162A	DIODE
D917	MA165	DIODE
D919	MA165	DIODE
D920	MA165	DIODE
D921	MA165	DIODE
VARIABLE RESISTORS		
VR301	EVND4AA00B53	V.R, MPX VCO ADJ.
VARIABLE CAPACITORS		
CT901	ECRLA010A52	TRIMMER CAPACITOR
COILS AND TRANSFORMERS		
L102	RLQZP1R2KT-Y	CHOKE COIL
L203	ELEPK1R0MA	COIL
L204	ELEPK1R0MA	COIL
L321	SLM1B9-P	MPX COIL
L322	SLM1B9-P	MPX COIL
L324	SLM1B10-M	COIL
L325	RLQZP1R2KT-Y	CHOKE COIL
L327	ELEPKR47MA	COIL
L328	ELEPKR47MA	COIL
L701 ⚠	SLQZ650MH49	CHOKE COIL
L901	RLQZP101KT-Y	COIL
L902	RLQZP101KT-Y	COIL
T201	SLI4B511-Z	I.F.TRANSFORMER
T202	SLI4B513-Z	I.F.TRANSFORMER
T701 ⚠	SLT5K262-K	POWER TRANSFORMER
COMPONENT COMBINATIONS		
Z1	SNVFE337G01	TUNER PACK
Z201	SLA2Z1-T	COIL
Z202	SLI7Z101-T	I.F.TRANSFORMER
Z321	SLA4Z13-Z	ANTENNA COIL
Z901	GP1U509M	DIODE , REMOTE SENSOR
FILTERS		
CF201	SVFE107MZ2-A	CERAMIC FILTER
CF201	SVFE107MZ2-B	CERAMIC FILTER
CF201	SVFE107MZ2-C	CERAMIC FILTER
CF202	SVFE107MM-A	CERAMIC FILTER
CF202	SVFE107MM-B	CERAMIC FILTER
CF202	SVFE107MM-C	CERAMIC FILTER
OSCILLATORS		
X101	SVQ49U722-S	CRYSTAL OSCILLATOR
X901	SVQ49U422-S	CRYSTAL OSCILLATOR
DISPLAYS		
FL901	SADFV273G	DISPLAY TUBE
FUSES		
F1 ⚠	XBA2C04TB0	FUSE , T0.4A250V
F2 ⚠	XBA2C25TB0	FUSE, T2.5A 250V
SWITCHES		
S901	EVQQB005R	SW, CH1
S902	EVQQB005R	SW, CH2
S903	EVQQB005R	SW, CH3
S904	EVQQB005R	SW, CH4
S905	EVQQB005R	SW, CH5
S906	EVQQB005R	SW, CH6
S907	EVQQB005R	SW, CH7
S908	EVQQB005R	SW, CH8
S909	EVQQB005R	SW, CH9
S910	EVQQB005R	SW, 0
S911	EVQQB005R	SW, TEST POINT
S912	EVQQB005R	SW, MEMO
S914	EVQQB005R	SW, CLOCK SET
S915	EVQQB005R	SW, TIME UP
S916	EVQQB005R	SW, TIME DOWN
S917	EVQQB005R	SW, TIMER SET
S918	EVQQB005R	SW, TIMER READ
S919	EVQQB005R	SW, STANDBY
S920	EVQQB005R	SW, CANCEL
S921	EVQQB005R	SW, SLEEP
S923	EVQQB005R	SW, MODE
S924	EVQQB005R	SW, DOWN
S925	EVQQB005R	SW, UP
S926	EVQQB005R	SW, FM
S927	EVQQB005R	SW, AM
S928	EVQQB005R	SW, POWER
RELAYS		
RLY701 ⚠	SSY138	RELAY

ST-X990

■ EXPLODED VIEW



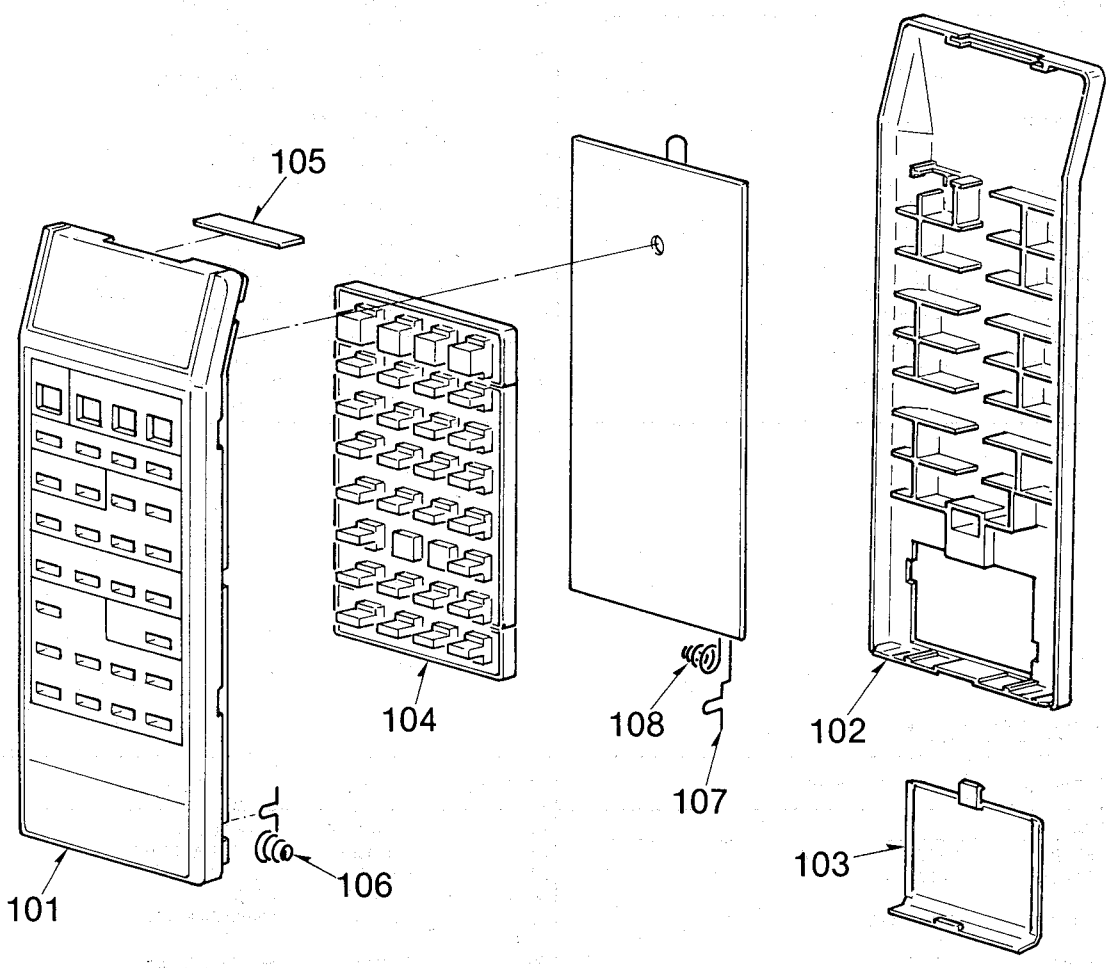
•CABINET PARTS LIST

Ref. No.		Part No.	Description
CABINET AND CHASSIS			
1		SGPTX990-KE1	REAR PANEL
(EI)			
1		SGPTX990-KE2	REAR PANEL [F]
(EI)			
1		SGP7360D	REAR PANEL
(EG)			
2		SKL307	FOOT
3	⚠	SJS9225	AC OUTLET
4		SHE181	HOLDER
5		SUW3102	BRACKET
6		SUS874	SPRING
7		SUS772	GROUND BRACKET
9		SHG6390	RUBBER SPACER
10		SGXTX990-KG	FRONT GRILLE
11		SBC986	BUTTON, POWER
12		SHG6385-2	RUBBER SPACER
13		SBZ9107	BUTTON, TUNING/SELECT
14		SBC988	BUTTON, TIMER
15		SBC989D	BUTTON, PRESET
16		SBC989E	BUTTON, PRESET
17		SBZ9104	BUTTON, PRESET/MEMORY
20		SGX7971A	ORNAMENT
22		XTBS3+8JFZ1	SCREW
23		XTB3+8G	SCREW
24		XTB3+20J	SCREW
25		SKC2060K16	CABINET
26		SNE2129-1	SCREW
44	⚠	SJT347	FUSE HOLDER
45		SJFD4	OUTPUT TERMINAL(PHONO)
46		SJF8305N	TERMINAL PLATE
47		SJS306	REMOTE CONTROL JACK
48	⚠	SJS9236	AC INLET
50		SJT30743LX-V	CONNECTOR(7P)
50		SJT31143-V	CONNECTOR(11P)
55		SGWTX990-KG	FRONT PANEL
56		SKU11651-1	BOTTOM BOARD

•PACKING PARTS LIST

Ref. No.		Part No.	Description
PACKING MATERIAL			
P1		SPP740	PROTECTION COVER
P2		SPG6348	PACKING CASE [F]
(EI)			
P2		SPG6349	PACKING CASE
(EG)			
P3		SPS5169	PAD
P4		SPS5170	PAD
ACCESSORIES			
A2		SSA270	ANTENNA
A4	⚠	SFDAC05E03	POWER CORD
A6		SPB1139-1	AM LOOP ANTENNA
A7		UM-4NE	BATTERY
A8		SJPK2203-1	CORD
A9		SQF13285	INSTRUCTION BOOK
(EG)			
A9		SQF13286	INSTRUCTION BOOK [F]
(EI)			
A10		SMA233-1M	HOLDER
A11		XTN3+10AFZ	SCREW
A12		SWKTX930E	LEAD WIRE
A13		SMA231M	BRACKET
A14		EUR64754	REMOTE CONTROLLER

•REMOTE CONTROL UNIT



•REMOTE CONTROL UNIT PARTS LIST

Ref. No.	Part No.	Description
REMOTE CONTROLL		
INTEGRATED CIRCUITS		
IC1	M50467018FP	INTEGRATED CIRCUIT
TRANSISTORS		
Q1	UN1231	TRANSISTOR
DIODES		
D1	LN66-S	L.E.D
COIL		
L1	ELEA101JA	COIL
OSCILLATOR		
X1	CSB420PB1	OSCILLATOR

Ref. No.	Part No.	Description
RESISTORS		
R1	ERDS2TJ1R0	CARBON, 1Ω, 1/4W
CAPACITORS		
C1	ECKD1H471KB	CERAMIC, 470PF, 50V
C2	ECKD1H121KB	CERAMIC, 120PF, 50V
C3	ECEA0GK101	ELECTROLYTIC, 100μF, 4V
MECHANISM PARTS		
101	UR64VCS566	UPPER CABINET
102	UR64CS803A	LOWER CABINET
103	UR64EC804	BATTERY COVER
104	UR64CT805D	RUBBER SWITCH
105	UR52SB327	PLATE
106	UR64TD374	BATTERY TERMINAL(COMMON)
107	UR64TD808	TERMINAL
108	UR64TD809	TERMINAL

■ RESISTORS AND CAPACITORS

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Pecliarity	Value (33μF)	

● Capacity values are in microfarads (μF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F).
● Resistance values are in ohms (Ω), unless specified otherwise, 1K=1,000Ω, 1M=1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Cip Resistor			
ERJ	: Cip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 % −20
ECQM	: Poyester	50 : 50V	05 : 50V	J : ±5%
ECQP	: Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG	: Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU	: Ceramic (Chip Type)	KC : 125V AC (UL)		D : ±0.5pF
ECUX	: Ceramic (Chip Type)			
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R102	ERDS2TJ103	10K 1/4
R104	ERDS2TJ102	1K 1/4
R105	ERDS2TJ561	560 1/4
R106	ERDS2TJ562	5.6K 1/4
R107	ERDS2TJ103	10K 1/4
R108	ERDS2TJ391	390 1/4
R201	ERDS2TJ332	3.3K 1/4
R202	ERDS2TJ824	820K 1/4
R203	ERDS2TJ122	1.2K 1/4
R204	ERDS2TJ824	820K 1/4
R205	ERDS2TJ271	270 1/4
R206	ERDS2TJ561	560 1/4
R207	ERDS2TJ822	8.2K 1/4
R208	ERDS2TJ102	1K 1/4
R209	ERDS2TJ471	470 1/4
R210	ERDS2TJ332	3.3K 1/4
R211	ERDS2TJ222	2.2K 1/4
R212	ERDS2TJ153	15K 1/4
R213	ERDS2TJ104	100K 1/4
R215	ERDS2TJ103	10K 1/4
R216	ERDS2TJ563	56K 1/4
R219	ERDS2TJ122	1.2K 1/4
R220	ERDS2TJ103	10K 1/4
R221	ERDS2TJ104	100K 1/4
R222	ERDS2TJ473	47K 1/4
R228	ERDS2TJ102	1K 1/4
R229	ERDS2TJ102	1K 1/4
R230	ERDS2TJ104	100K 1/4
R231	ERDS2TJ102	1K 1/4
R232	ERDS2TJ122	1.2K 1/4
R233	ERDS2TJ684	680K 1/4
R234	ERDS2TJ103	10K 1/4
R235	ERDS2TJ471	470 1/4
R240	ERDS2TJ152	1.5K 1/4
R247	ERDS2TJ103	10K 1/4
R301	ERDS2TJ393	39K 1/4
R302	ERDS2TJ151	150 1/4
R303	ERDS2TJ223	22K 1/4
R304	ERDS2TJ223	22K 1/4
R305	ERDS2TJ272	2.7K 1/4
R306	ERDS2TJ272	2.7K 1/4
R307	ERDS2TJ562	5.6K 1/4
R308	ERDS2TJ562	5.6K 1/4
R309	ERDS2TJ104	100K 1/4
R311	ERDS2TJ102	1K 1/4
R312	ERDS2TJ153	15K 1/4
R313	ERDS2TJ473	47K 1/4
R314	ERDS2TJ473	47K 1/4
R315	ERDS2TJ103	10K 1/4
R316	ERDS2TJ102	1K 1/4
R317	ERDS2TJ473	47K 1/4
R321	ERDS2TJ153	15K 1/4
R322	ERDS2TJ153	15K 1/4
R325	ERDS2TJ102	1K 1/4
R326	ERDS2TJ102	1K 1/4
R327	ERDS2TJ183	18K 1/4
R328	ERDS2TJ473	47K 1/4
R329	ERDS2TJ824	820K 1/4
R331	ERDS2TJ221	220 1/4
R332	ERDS2TJ221	220 1/4
R702	ERDS2TJ102	1K 1/4
R703	ERDS2TJ331	330 1/4
R704	ERDS2TJ222	2.2K 1/4
R705	ERDS2TJ221	220 1/4
R715	ERDS2TJ101	100 1/4
R716	ERDS2TJ101	100 1/4
R717	ERDS2TJ101	100 1/4
R901	ERDS2TJ222	2.2K 1/4
R902	ERDS2TJ222	2.2K 1/4
R903	ERDS2TJ222	2.2K 1/4
R904	ERDS2TJ562	5.6K 1/4
R913	ERDS2TJ154	150K 1/4
R914	ERDS2TJ154	150K 1/4
R915	ERDS2TJ154	150K 1/4
R916	ERDS2TJ154	150K 1/4
R920	ERDS2TJ103	10K 1/4
R921	ERDS2TJ333	33K 1/4
R922	ERDS2TJ103	10K 1/4
R923	ERDS2TJ562	5.6K 1/4
R924	ERDS2TJ563	56K 1/4
R927	ERDS2TJ563	56K 1/4
R932	ERDS2TJ562	5.6K 1/4
R933	ERDS2TJ562	5.6K 1/4
R934	ERDS2TJ562	5.6K 1/4
R935	ERDS2TJ562	5.6K 1/4
R936	ERDS2TJ562	5.6K 1/4
R937	ERDS2TJ562	5.6K 1/4
R938	ERDS2TJ563	56K 1/4
R941	ERDS2TJ331	330 1/4
R942	ERDS2TJ104	100K 1/4
R943	ERDS2TJ122	1.2K 1/4
R944	ERDS2TJ824	820K 1/4
R945	ERDS2TJ474	470K 1/4
R946	ERDS2TJ124	120K 1/4
R947	ERDS2TJ274	270K 1/4
R948	ERDS2TJ273	27K 1/4
R949	ERDS2TJ474	470K 1/4
R951	ERDS2TJ104	100K 1/4
R952	ERDS2TJ104	100K 1/4
R954	ERDS2TJ102	1K 1/4
R955	ERDS2TJ102	1K 1/4
R957	ERDS2TJ561	560 1/4
CAPACITORS(VALUE,VOLTAGE)		
C101	RCBS1H150JCY	15P 50
C102	RCBS1H150JCY	15P 50
C103	ECBT1H102KB	0.001 50
C104	RCBS1H181KBY	180P 50
C105	ECEA0JU101	100 6.3
C106	ECKD1H103PF	0.01 50
C107	ECKD1H103PF	0.01 50
C108	ECEA25M4R7	4.7 25
C109	ECEA1CU330	33 16
C110	ECBT1H102KB	0.001 50
C111	ECKD1H103PF	0.01 50
C112	ECKD1H103PF	0.01 50
C201	ECKD1H103PF	0.01 50
C202	ECKD1H103PF	0.01 50
C204	RCBC1H470JLY	47P 50
C205	ECKD1H223PF	0.022 50
C206	RCBS1H150JCY	15P 50
C208	ECEA0JU101	100 6.3
C209	ECEA1EK4R7	4.7 25
C210	ECKD1H223PF	0.022 50

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
C211	ECKD1H223PF	0.022 50	C312	ECKD1H103PF	0.01 50	C718	ECKD1H103PF	0.01 50
C212	ECKD1H223PF	0.022 50	C313	ECBT1H102KB	0.001 50	C719	ECEA1EU101	100 25
C213	RCBC1H101KBY	100P 50	C314	ECBT1H102KB	0.001 50	C720	ECKD1H103PF	0.01 50
C214	ECEA1CKS100	10 16	C316	ECEA1HKR47	0.47 50	C725	ECEA1VU330	33 35
C215	ECKD1H103PF	0.01 50	C321	ECEA1CKS100	10 16	C726	ECEA1VU330	33 35
C216	ECEA1HKR47	0.47 50	C323	ECFTD332KXL	0.0033 25	C730 ⚠	ECKWNS103ZVS	0.01 250
C217	ECEA1HK010	1 50	C324	ECFTD332KXL	0.0033 25	C731	ECEA1HS330	33 50
C220	ECEA1CKS100	10 16	C325	RCBS1H330JLY	33P 50	C732	ECKD1H103PF	0.01 50
C222	ECFTD473KXL	0.047 25	C326	ECKD1H103PF	0.01 50	C912	ECKD1H103PF	0.01 50
C225	RCBS1H180JCY	18P 50	C327	ECBT1H102KB	0.001 50	C913	ECEA1CKS100	10 16
C226	ECKD1H103PF	0.01 50	C701	ECEA1CU222	2200 16	C914	ECEA1HK010	1 50
C227	ECEA1CKS100	10 16	C702	ECEA16V1000	1000 16	C915	ECEA1VK3R3	3.3 35
C230	RCBC1H471KBY	470P 50	C704	ECBT1H102KB	0.001 50	C916	RCBC1H120KCY	12P 50
C301	ECEA1CU101	100 16	C705	ECEA1CU221	220 16	C917	RCBS1H5R6KCY	5.6P 50
C302	ECEA1HKR47	0.47 50	C706	ECEA1CKS100	10 16	C921	RCBC1H101KBY	100P 50
C303	ECEA1HK010	1 50	C707	ECKD1H103PF	0.01 50	C922	RCBC1H101KBY	100P 50
C304	ECEA1VK3R3	3.3 35	C710	ECKD2H102ZF	0.001 500	C924	RCBC1H101KBY	100P 50
C305	ECEA1VK3R3	3.3 35	C711	ECKD1H103PF	0.01 50	C925	RCBC1H101KBY	100P 50
C306	ECEA1VK3R3	3.3 35	C712	EECF5R5U473	0.047F 5.5	C926	RCBC1H101KBY	100P 50
C307	ECFTD392KXL	0.0039 25	C713	ECKD1H103PF	0.01 50	C927	RCBC1H101KBY	100P 50
C308	ECFTD392KXL	0.0039 25	C714	ECEA0JS102	1000 6.3	C928	RCBC1H101KBY	100P 50
C310	ECFTD473KXL	0.047 25	C716	ECEA1VU330	33 35	C930	RCBC1H101KBY	100P 50
C311	ECQP1471JZ	470P 125	C717	ECKD2H102ZF	0.001 500	C942	ECBT1H102KB	0.001 50

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